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FACT SHEET

FOR PART-TIME
FARMERS AND
GARDENERS



UNITED STATES
DEPARTMENT
OF AGRICULTURE

STEPS IN FERTILIZING GARDEN SOIL

STEP 1—HAVE SOIL TESTED

You can't look at the soil, smell it, or feel it and tell whether it has 30 pounds or 300 pounds of available phosphate. But you can have a sample tested to tell you how much available phosphorus is in it.

Why is it so important to know how much phosphorus is in your soil? Simply because vegetables and flowers grow poorly where soils contain less than 300 pounds per acre.

Your soil test report also tells you the level of nitrogen, potassium, calcium (lime), and magnesium in your garden, and indicates the pH of the soil. This is about all you have to know to properly fertilize your garden soil.

To make it easy for you to interpret the soil test results, your report form will indicate *how much of what kinds of fertilizer you should apply in carrying out step 2.*

How do you take a soil sample?

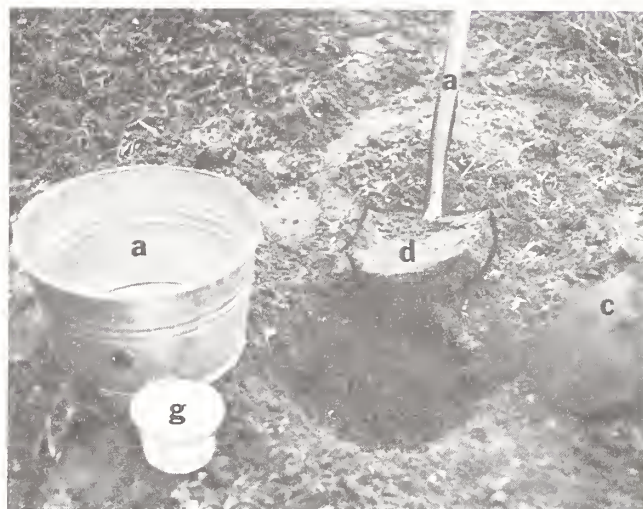
- With a spade make a deep hole in the soil.
- Throw out a spade full of soil.
- Cut a 1/2- to 1-inch slice of soil from the back of the hole. Be sure the slice is 7 inches in depth and fairly even in width and thickness.
- Place this sample slice in a bucket.
- Repeat five or six times at different spots in your garden.
- Thoroughly mix the six or seven slices you have in the bucket.
- After thoroughly mixing, take out about 1 pint of soil and mail it to your State soil testing laboratory. Your local county agent can tell you how and where to mail the sample.

How long will it take to get the results?

Usually from 1 to 2 weeks, depending upon the number of samples coming in to the soil testing lab.

When should the sample be taken?

Any time of the year—but, if you can take your sample during October, November, or December you will likely get faster service than in the rush season, January through March.



Good garden soil provides both a chemical and physical environment for root development.

How often should your soil be tested?

Once every 4 or 5 years is sufficient if you follow steps 3, 4, 5, and 6.

Is there a charge for this soil test?

Yes, a nominal fee to cover costs of chemicals and a technician.

STEP 2—ESTABLISH BASIC FERTILITY LEVEL

You establish the basic fertility level by simply applying fertilizer—the *right kind* and *right amount*—to your garden soil. Your soil test report will indicate the kind and amount to apply.

Remember that this basic application is a fertility-building process and will not be needed every year. After the basic fertility level has been established, it can be maintained by following steps 3, 4, and 5.

The best method for making the *basic application* is to first put on half the recommended fertilizer and to plow or spade deeply. Then apply the other half and disc or rake it in lightly. This distributes the fertilizer throughout the upper 7 inches of soil.

Important! Your soil test report may recommend “*no basic application*.” This means the fertility level of your garden is all right. If the report shows you have too much of an element, leave it out of fertilizer applications. Plowing just a little deeper for a year or two and sowing green manure crops will also help reduce the effects of the element that is in excess.

STEP 3—APPLY FERTILIZER TO MAINTAIN THE BASIC FERTILITY LEVEL

Each year after the basic fertility level has been established, it is important to apply *fertilizer* to the soil to maintain the basic level. Fertilizer is usually applied in the spring before the soil is worked into a seedbed. It need not be worked deeply into the soil—the upper 3 to 5 inches will do. The purpose of this maintenance application is to *replace* the fertility you have taken off in the form of vegetables, flowers, and crop residue the preceding year.

Again, the question comes up: “How much of what kind of fertilizer should I use?” A mixed fertilizer is used for this maintenance application. A mixed fertilizer contains three plant nutrients: Nitrogen (N), phosphorus (P), and potassium (K).

When you see a fertilizer bag with a combination of numbers such as 8-24-8, 12-12-12, or 6-24-24, the bag contains mixed fertilizers. The middle number always refers to the pounds of the oxide of phosphorus (P_2O_5), which is 44 percent P by weight, and the last number refers to the pounds of the oxide of potassium (K_2O), which is 42 percent K by weight per 100 pounds of the fertilizer.

Thus, for example, for every 100 pounds of 8-24-8 fertilizer you buy, you get 8 pounds of N, 24 pounds of P_2O_5 (or 10.5 pounds of P), and 8 pounds of K_2O (or 3.3 pounds of K).

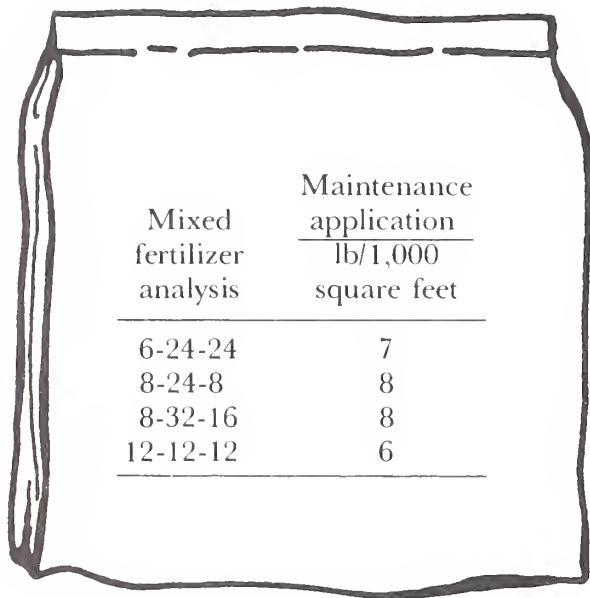
Four of the mixed fertilizers most commonly sold are listed below on the sketch of a fertilizer bag. Check the analysis on your bag of fertilizer and find the corresponding analysis in the table below. The second column indicates the amount to use per 1,000 square feet of garden area. If the analysis on your bag is different from that listed below, choose the one in the table that is nearest to yours and use the rate indicated.

STEP 4—USE STARTER FERTILIZER

As defined here, a starter fertilizer is a *water soluble fertilizer used in the transplant water*.

Phosphorus is the most important element needed in getting your transplants off to a good start. Therefore, select a water soluble fertilizer that has a high phosphorus content in relation to the nitrogen and potash.

The following are the best and most commonly available water soluble fertilizers: 10-52-17, 8-32-16, 12-24-12, 15-30-15, and 13-26-13. Use any of the above at the rate of 2 *level* tablespoons per gallon of water. Apply 1 *cup* of this solution around the roots of your plant after you place it in the ground.



Mixed fertilizer analysis	Maintenance application <hr/> lb/1,000 square feet
6-24-24	7
8-24-8	8
8-32-16	8
12-12-12	6

STEP 5—SIDE-DRESS WITH NITROGEN

Vegetables and flowers vary in the amounts of nitrogen they need. Usually, vegetable crops require *most* of their nitrogen *after they have made considerable growth or have begun to fruit*. Too much nitrogen before this time will delay maturity and reduce flowering and yields.

The major portion of the nitrogen your plants use comes from three sources: (1) The breakdown of organic matter, (2) the yearly maintenance application of fertilizer, and (3) the nitrogen side dressings.

Until the plant starts fruiting or makes considerable growth, it will receive enough nitrogen from the first two sources. But afterward, the demand of the plant for nitrogen often exceeds that supplied by the first two, and a nitrogen side dressing is needed. Because vegetable crops vary so greatly in both the amount of nitrogen side dressings required and times of application, the chart below was developed for handy reference. Fertilizer requirements for annual flowers do not vary as much, and a single treatment may be made for an entire season.

RECOMMENDED NITROGEN SIDE DRESSINGS

Crop	Amount of Side Dressing (Pounds per 100-foot row*) Animonium Nitrate** 33-0-0	Time of Application (Sprinkle the nitrogen fertilizer in the row middles and water if rain is not likely)
Vegetables		
Tomato	1	1) 1 to 2 weeks before first tomato ripens 2) 2 weeks after picking first ripe tomato 3) 1 month later
Cucumber, cantaloupe	1	1) 1 week after blossoming begins 2) 3 weeks later
Sweet corn	1	1) When plants are 8-10 inches tall 2) 1 week after tassels appear
Asparagus	2	Before growth begins in spring
Potato	1-1/2	After tuber formation starts
Peas & beans	1	After heavy bloom and set of pods
Peppers, eggplants	1	After first fruit sets
Cabbage, cauliflower, broccoli	1	3 weeks after field transplanting
Spinach, kale, mustard & Turnip greens	1	When plants are about one-third grown
Onions (mature)	1	1 to 2 weeks after bulb formation starts
Sweetpotatoes, watermelons, carrots, beets, turnips, parsnips, lettuce	None	Excessive amounts of nitrogen will reduce yields, or lower quality, or both Side dressings of nitrogen not needed
Annual flowers	1	4 to 6 weeks after planting

*A pint of ammonium nitrate weighs approximately 1 pound.

**Other forms of nitrogen, such as urea and ammonium sulfate, may be used on an equivalent nitrogen basis.

STEP 6—MAINTAIN ORGANIC MATTER

So far, we have been primarily concerned with the *chemical* aspects of garden soils. Just as important are the *physical properties*. Two major things contribute to physical properties of your soil: *Type of soil* (sandy or clay) and *organic matter*. You can't alter soil type much, but you can control organic matter.

Sandy soils should contain 2 to 3 percent organic matter; clay type soils need 4 to 5 percent. Annual applications of organic matter are required to reach these levels and maintain them.

Kind of organic matter to use and the way to apply it.

For farm gardens, use animal manures and green manures; for town gradens, use peat moss, compost, and animal manures.

Peat moss makes an excellent source of organic material for the small garden. Coarse types will provide the best soil conditioning.

To make a compost pile, gather all waste material, such as grass clippings, leaves, and plant refuse, and place in layers 6 to 8 inches deep. The pile can be as long as desired but should not be over 5 feet wide and 5 feet high.

Add a little soil and a hand full of fertilizer to each layer as you build it up. Keep the pile moist. It will be ready in 6 months to a year.

Animal manures are excellent. They should be well rotted, applied in the *fall*, and plowed under. Weed seeds are the chief objection to animal manures.

Peat moss, compost, or animal manure should be applied about 2 inches below the soil surface, and then worked in thoroughly.

Green manures are legumes or small grain crops that are plowed under *while still in the green stage*. Winter green manure crops include rye, wheat, barley, and winter vetch.

Summer green manure crops include Sudan grass, soybeans, and cowpeas.

An excellent way to handle organic matter is to plant half of the garden to a winter green manure crop in September or early October. Then, put some well-rotted animal manure on the other half, fall plow it, and plant spring vegetables in this part. The following spring, turn under the green manure crop and plant your summer vegetables. Rotate these areas each year. After turning under a green manure crop, *always wait 3 weeks before planting*.